FLORISTIC COMPOSITION OF TWO WEST LOUISIANA PITCHER PLANT BOGS

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Pitcher plant bogs occur in southeastern and in western Louisiana, but there is almost no information about their abundance, status, or floristics (McDaniel 1971, Barker & Williamson 1988, Allen *et al.* 1988, Murry & Urbatsch 1979). In fact, so little is known about the status of the identifying species west of the Mississippi delta that Folkerts (1977) emphasized the necessity of studying *Sarracenia alata* in this region to determine if the species is endangered. Although pitcher plant bogs in east Texas and in southern Mississippi are better known than those in Louisiana (Folkerts 1982, Nixon & Ward 1986), Nixon and Ward (1986) point out in their recent study of six Texas bogs that information about bogs in eastern Texas is scarce; in their review they were able to cite only two papers that dealt mainly with floristics.

The purpose of this paper is to describe the floristics and soils of two pitcher plant bogs in Natchitoches Parish, Louisiana.

STUDY SITES. Strange Road Bog, located in the Winn District of the Kisatchie National Forest 4 km NW of Goldonna, is situated on a gently sloping hillside about 60 m above sea level. This bog is about .4 ha and is surrounded by elements of Beech-Magnolia-Loblolly and Longleaf-Bluestem Upland habitats (Ajilvsgi 1979). It is approximately 240 km inland, making it the most northern "undisturbed" pitcher plant bog in Louisiana.

Middle Branch Bog, located in the Kisatchie District of the Kisatchie National Forest 5 km E. of Lotus, is approximately 65km SSW of Strange Road Bog. It is linear following the contour of an irregular sloping (10^{o}-20^{o}) hillside about 84 m above sea level. The bog covers approximately 3 ha and is surrounded by elements of Longleaf-Bluestem Upland (Ajilvsgi 1979). Middle Branch Bog is burnt by the Forest Service on a regular basis during the winter.

The two bogs belong to the slope community type and

are open with a few scattered trees and shrubs. Sphagnum is present in both but is not a dominant plant. Both bogs occur on fine, slow-draining loam that is kept damp through the year by seeps at their upper margins. Both are located in a humid subtropical zone in which temperatures rarely go below -6°C in winter or above 38°C in summer. Average annual precipitation is between 120 and 130 cm.

METHODS. We visited the bogs at two-week intervals from June through November 1987 and from March to July 1988. A voucher specimen for each of 116 reported species was placed in the LSU-S herbarium. We did not collect rare or unproblematic species. Because Middle Branch Bog has been collected in the past, we examined specimens in several state herbaria. We follow MacRoberts (1984, 1988) for scientific nomenclature. Two soil samples from the upper 15 cm of each bog were analyzed by A & L Agricultural Laboratories, Memphis, Tennessee.

RESULTS. Table 1 gives soil information for both bogs.

Table 1. Soil Characteristics

			Exchangeable Ions (ppm)			
Site/Sample		pH	P	K	Ca	Mg	OM%
Middle Branch	1	4.5	4	58	130	22	2.1
	2	5.2	4	82	410	176	1.9
Strange Road	1	5.1	1	35	120	15	0.6
	2	4.9	1	37	80	15	1.4

Table 2 lists the species found at the two bogs. Double asterisk indicates presence at Strange Road Bog only, single asterisk at Middle Branch Bog only, and no symbol indicates presence at both bogs.

Table 2. List of Taxa of Two Natchitoches Bogs

BLECHNACEAE - Lorinseria areolata (L.) Presl. *

DENNSTAEDTICEAE - Pteridium aquilinum (L.) Kuhn.

LYCOPODIACEAE - Lycopodium alopecuroides L. **, L. appressum (Chapm.) Lloyd & Underw., L. carolinianum L., L. cernuum L. *

OSMUNDACEAE - Osmunda cinnamomea L., O. regalis L.

PINACEAE - Pinus palustris P.Mill., P. taeda L.

AMARYLLIDACEAE - Hypoxis hirsuta (L.) Cov., H. rigida Chapm.

BURMANNIACEAE - Burmannia capitata (Walt.) Mart.

CYPERACEAE - Carex glaucescens Ell.*, Cyperus haspan L. *, C. strigosus L. *, Eleocharis tortilis (Link) Roem. & Schult. **, E. tuberculosa (Michx.) Roem. & Schult. *, Fuirena squarrosa Michx., Rhynchospora glomerata (L.) Vahl. *, R. gracilenta Gray, R. inexpansa (Michx.) Vahl, R. macra (C.B. Clark) Small *, R. microcarpa Baldw. ex Gray, R. oligantha Gray *, R. plumosa Ell., R. rariflora (Michx.) Ell. **, Scleria ciliata Michx.*, S. reticularis Michx. *, S. triglomerata Michx. **

ERIOCAULACEAE - Eriocaulon decangulare L., Lachnocaulon anceps (Walt.) Morong *, L. minus (Chapm.) Gray. **

JUNCACEAE - Juncus debilis Gray *, J. diffusissimus Buckl. *, J. marginatus Rostk. *, J. scirpoides Lam., J. tenuis Willd. *

LILIACEAE - Aletris aurea Walt., Smilax laurifolia L.

ORCHIDACEAE - Calopogon barbatus (Walt.) Ames *, C. tuberosus (L.) B.S.P., Platanthera ciliaris (L.) Lindl. **, P. cristata (Michx.) Lindl. **, P. integra (Nutt.) Gray ex Beck *, P. nivea (Nutt.) Luer *, Pogonia ophioglossoides (L.) Juss., Spiranthes vernalis Engelm. & Gray.

POACEAE - Agrostis hyemalis (Walt.) B.S.P. *, Andropogon ternarius Michx., Anthaenantia villosa (Michx.) Beauv. **, Aristida virgata Trin. **, Dichanthelium acuminatum (Sw.) Gould & Clark **, D. dichotomum (L.) Gould *, D. scabriusculum (Ell.) Gould & Clark *, D. scoparium (Lam.) Gould **, Muhlenbergia expansa (Poir.) Trin. *, Panicum rigidulum Bosc ex Nees **, P. verrucosum Muhl. **, P. virgatum L. *, Paspalum laeve Michx. **, P.notatum Flugge *, P. urvillei Steud. *, Schizachyrium scoparium (Michx.) Nash, S. tenerum Nees. *

XYRIDACEAE - Xyris ambigua Bey. ex Kunth, X. baldwiniana Schultes, X. difformis Chapm., X. drummondii Malme *, X. torta Smith. **

ACERACEAE - Acer rubrum L.

ANACARDIACEAE - Rhus copallina L. **

APIACEAE - Eryngium integrifolium Walt., Ptilimnium capillaceum (Michx.) Raf.

AQUIFOLIACEAE - Ilex opaca Ait., I. vomitoria Ait.

ASCLEPIADACEAE - Asclepias longifolia Michx. *, A. rubra L. **, A. viridiflora Raf. **

ASTERACEAE - Aster dumosus L., A. ericoides L. *, Cacalia ovata Walt. *, Chaptalia tomentosa Vent. *, Coreopsis linifolia Nutt., Eupatorium leucolepis (DC.) T. & G., E. rotundifolium L., Helianthus angustifolius L., Liatris pycnostachya Michx., Marshallia tenuifolia Raf.

BETULACEAE - Alnus serrulata (Ait.) Willd.

CAMPANULACEAE - Lobelia reverchonii B. L. Turner.

CAPRIFOLIACEAE - Viburnum nudum L. **

CLUSIACEAE - Hypericum densiflorum Pursh **, H. fasciculatum Lam. *, H.gentianoides (L.) B.S.P. *, H. hypericoides (L.) Crantz *, H. stans (Michx.) Adams & Robson. **

DROSERACEAE - Drosera brevifolia Pursh, D. capillaris Poir.

ERICACEAE - Lyonia ligustrina (L.) DC. **, Rhododendron canescens (Michx.) Sw. **, Vaccinium corymbosum L.

FABACEAE - Tephrosia onobrychoides Nutt.

GENTIANACEAE - Sabatia gentianoides Ell.

HALORAGIDACEAE - Myriophyllum aquaticum (Vell.) Verdc. *

HAMAMELIDACEAE - Liquidambar styraciflua L.

LAMIACEAE - Scutellaria integrifolia L. **

LAURACEAE - Persea borbonia (L.) Spreng.

LENTIBULARIACEAE - Pinguicula pumila Michx. *, Utricularia cornuta Michx. *, U. juncea Vahl *, U. subalata L.

LOGANACEAE - Cynoctonum sessilifolium (Walt.) St. Hil., Gelsemium sempervirens (L.) St. Hil.

MAGNOLIACEAE - Magnolia grandiflora L., M. virginiana L.

MELASTOMATACEAE - Rhexia lutea Walt. *, R. mariana L. **, R. petiolata Walt.

MYRICACEAE - Myrica cerifera L., M. heterophylla Raf.

ONAGRACEAE - Ludwigia alternifolia L., L. hirtella Raf.

POLYGALACEAE - Polygala cruciata L. **, P. incarnata L. *, P. mariana P. Mill., P. nana (Michx.) DC., P. ramosa Ell. *

ROSACEAE - Aronia arbutifolia (L.) Pers., Rubus louisianus Berger.

RUBIACEAE - Diodia teres Walt. **, D. virginiana L. **, Hedyotis boscii DC. **, Mitchella repens L. **

SARRACENIACEAE - Sarracenia alata Wood.

SCROPHULARIACEAE - Gratiola neglecta Torr. **, G. pilosa Michx. **

VIOLACEAE - Viola primulifolia L.

DISCUSSION. The soils of the two bogs are similar and are in turn similar to bogs in east Texas 120 - 150 km to the WSW (Nixon & Ward 1986). The main difference between the soils of the Natchitoches and east Texas bogs is that the organic matter of the former is less in all samples.

We recorded 138 taxa representing 77 genera and 44 families for the two bogs. Strange Road Bog had 96 taxa and Middle Branch Bog had 106 taxa. The two bogs had

46% of their taxa in common.

Some of the plants we report for Middle Branch we did not find but are collections made in previous years. These are Rhynchospora macra (Holmes 2347 NATC), Lycopodium cernuum (Holmes 3360 NATC), Scleria reticularis (Holmes 3956 NATC), Xyris drummondii (Thomas & Allen 41394 NLU), and Utricularia juncea (Holmes 3098 NATC). MacRoberts (1988) reports that he has not seen a definitive report of Rhynchospora oligantha from Louisiana. This species is ubiquitous at Middle Branch (Barbour 1321 LSUS, MacRoberts & MacRoberts 677, 701 LSUS). We saw only one Platanthera integra at Middle Branch. We did not collect it (Holmes 3863 NATC).

Strange Road and Middle Branch bog are floristically similar to the east Texas bogs described by Nixon and Ward (1986). The Texas bogs ranged from 88 to 116 taxa with an average of 103 taxa. The two Natchitoches bogs averaged 101 taxa. Although Nixon and Ward do not provide a total list of species for the six bogs they studied, they do list 48 species with presence values greater than 80%. The Natchitoches bogs had 88% of these species. The only species missing that were present in the Texas bogs were Rhus vernix , which occurs in other bogs near Middle Branch, Centella asiatica and Eriocaulon texensis , both of which occur in bogs in Vernon Parish 50 km south of Middle Branch, Heterotheca gramnifolia , which occurs peripherally at Middle Branch, Agalinus purpurea , which grows on the periphery of both bogs, and Paspalum floridanum , which is locally common.

In a future paper we will describe the status and distribution of pitcher plant bogs in western Louisiana. We find that these bogs are rare and endangered and that immediate action is needed to preserve them.

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